Cost and Software Data Reporting Training

Evolutionary Acquisition Module

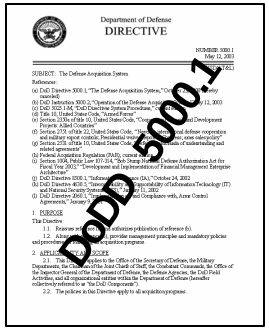
Schedule

DAY 1	DAY 2	DAY 3
0800 Class Orientation	0800 Contract Planning	0900 Question / Answer Session
0830 Background / Familiarization Module	0915 SRDR Planning (Part 1)	930 Validation (Part 1)
0945 Break	1015 Break	1015 Break
1000 WBS Module	1030 SRDR Planning (Part 2)	1030 Validation (Part 2)
1130 Lunch	1130 Lunch	1130 Lunch
1230 RAM Module	1230 Contracting	1230 SRDR Reporting
1330 Evolutionary Acquisition	1330 Cost Reporting (Part 1)	1400 Break
1430 Break	1500 Break	1415 Final Exam
1445 Program Planning Module	1515 Cost Reporting (Part 2)	1615 Wrap-Up

Lesson Assignment Sheet

- Objectives:
  - For students to know how and when to build and use an effective Project Applicability Matrix (PAM)
- Desired Learning Outcomes:
  - Understand the differences between traditional “single-step” development and “evolutionary acquisition” development processes
  - Understand the differences between “spiral development” and “incremental development” processes
  - Understand how evolutionary acquisition impacts cost data reporting
  - Understand how to properly structure a PAM
  - Be able to use a PAM to refine the WBS
- Assignment:
  - EXERCISE 5-1. HOUSE PAM
- Reference Material:
  - CSDR Reference Book
    - DoD Directive 5000.1, “*The Defense Acquisition System”*
    - DoD Instruction 5000.2, “*Operation of the Defense Acquisition System*”
    - USD AT&L Memo, “*Evolutionary Acquisition and Spiral Development*”
  - CSDR Workbook
    - *The Spiral Model as a Tool for Evolutionary Acquisition,* Dr. Barry Boehm, Wilfred J. Hansen, Crosstalk, May 2001
    - National Defense Authorization Act, Dec 2002, Public Law 107-314, Division A, Title VIII, Subtitle A, Section 803
  - Internet
    - DoD 5000.4-M-1, Cost and Software (CSDR) Manual (DRAFT September 2005), DL1.35, C3.5.7, C4.1.1, C5.3.17.2 (http://dcarc.pae.osd.mil/csdr/CSDR_Manual_4-1-04-R22.pdf)

DoD Directive 5000.1


Department of Defense
DIRECTIVE

NUMBER 5000.1
May 12, 2003

SUBJECT: The Defense Acquisition System

References:

DoDD 5000.1

1. PURPOSE

The Directive

2. APPLICABILITY AND SCOPE

- 4.3.2 Policy - Responsiveness.

"Advanced technology shall be integrated into producible systems and deployed in the shortest time practicable. Approved, time-phased capability needs matched with available technology and resources enable evolutionary acquisition strategies. Evolutionary acquisition strategies are the preferred approach to satisfying operational needs. Spiral development is the preferred process for executing such strategies."

DoD Instruction 5000.2

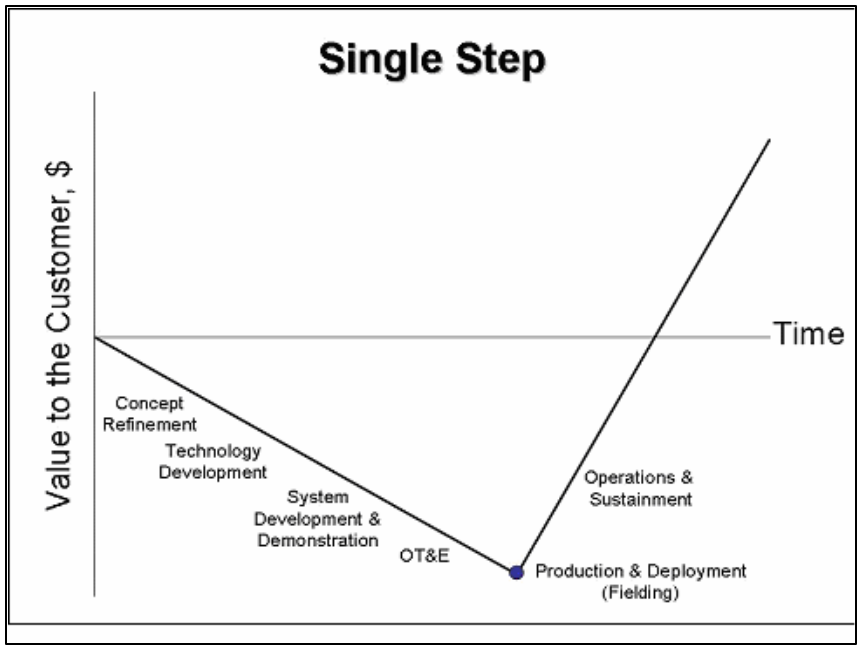
- C3.3 Evolutionary Acquisition.

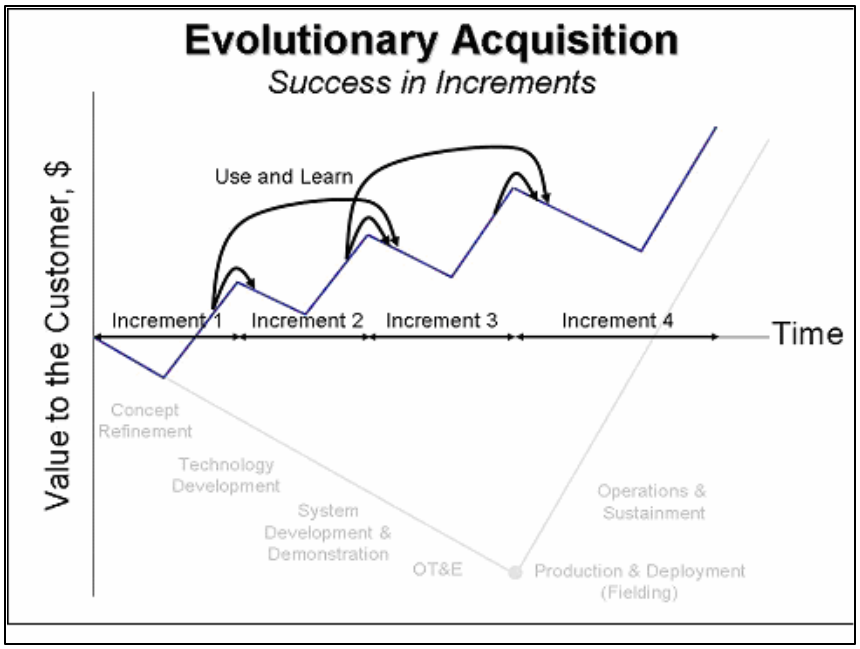
"Evolutionary Acquisition is the preferred DoD strategy for rapid acquisition of mature technology for the user."

"The approaches to achieve evolutionary acquisition require collaboration between the user, tester, and developer. They include: [Incremental Development and Spiral Development]."

The primary aim of Evolutionary Acquisition is to enhance a program's ability to field capabilities faster and with more flexibility than a traditional Single Step Acquisition program.

Incremental Development

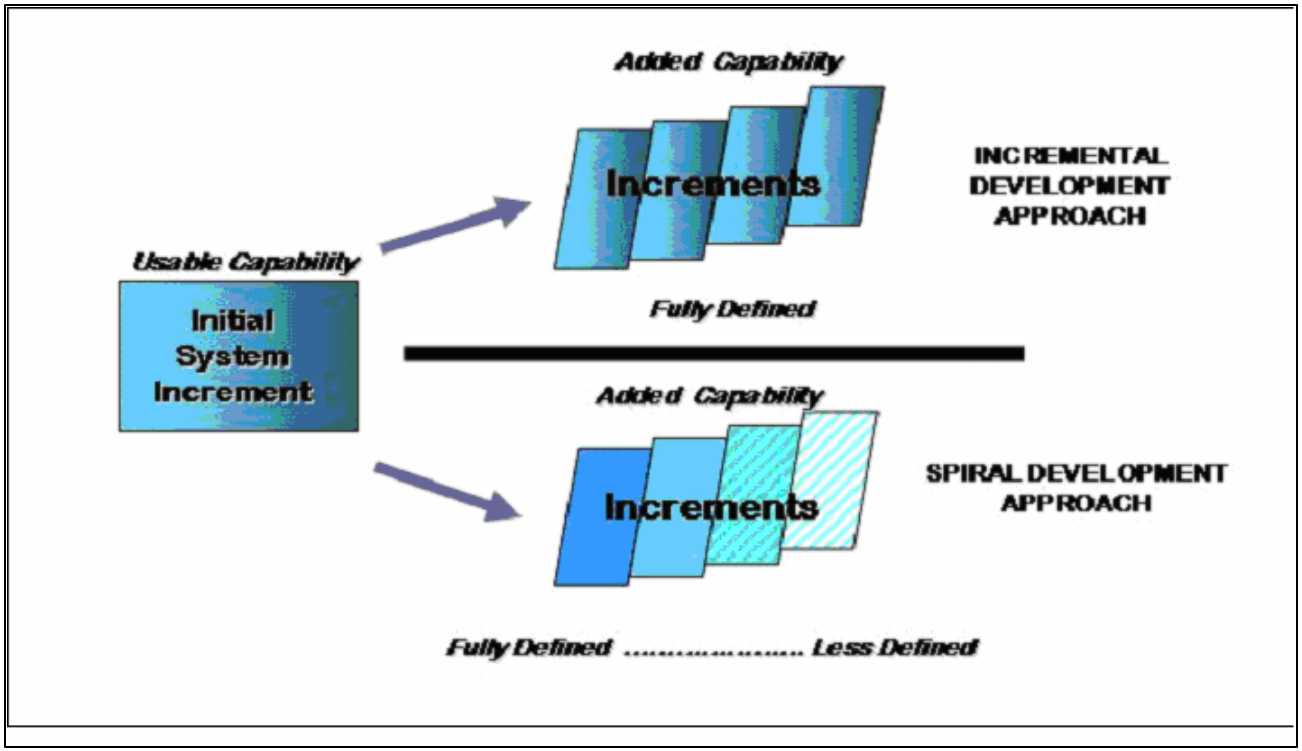




- Incremental development requires incremental contracting via separate contracts or delivery orders
- Typically, each increment includes a number of individual projects
- Adds another layer of complexity to the cost data planning and reporting process

Graphics adapted from "Process Design and Implementation: Reengineering and Change Management," Hammer & Company, Jan 03

Spiral Development

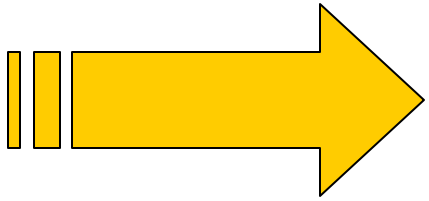


- Incremental development: each future increment is *fully* defined
- Spiral development: each future increment is only *partially* defined

Graphic adapted from the draft AFMC pamphlet titled "Evolutionary Acquisition Strategies," 8 April 2005

Evolutionary Acquisition & the CSDR Process

- Evolutionary acquisition adds complexity to the cost data report planning process
- The terms “Incremental” and “Spiral” are often used interchangeably, despite differences in meaning
- The job of the CSDR planner is to *understand* the acquisition technique employed and project/contract relationships



A tool we use to understand these inter-relationships is the “PAM”

Don’t lose sight of the overall objective of the CSDR process: to obtain valid, well-defined, historical cost data reports for the purpose of aiding in the development of life cycle estimates for future programs.

Project Applicability Matrix (PAM)

The PAM identifies inter-relationships between specific increments, projects within increments, and WBS elements within projects

- Components
  - Program WBS
  - Increment (or spiral) names
  - Project titles
  - Contract names/numbers
  - Estimated project costs

Don't lose sight of the overall objective of the CSDR process: to obtain valid, well-defined, historical cost data reports for the purpose of aiding in the development of life cycle estimates for future programs.

PAM FORMAT

Merge the WBS* with descriptive spiral/project information…

WBS Element Code	WBS				
	L1	L2	L3	L4	L5
1	RADAR SYSTEM				
1.1		PRIME MISSION PRODUCT			
1.1.1			DISPLAY		
1.1.2			RECEIVER/TRANSMITTER		
1.1.3			ANTENNA		
1.1.3.1				PEDESTAL	
1.1.3.1.1					HOUSING
1.1.3.1.2					PLATFORM
1.1.3.1.3					GYRO
1.1.3.2				SAIL	
1.1.3.3				WAVEGUIDE	
1.1.4			SOFTWARE		
1.2		SE/PM			
1.3		ST&E			
1.4		TRAINING			
1.5		DATA			
1.6		SUPPORT EQUIPMENT			
1.6.1			TEST & MEASUREMENT EQUIP.		
1.6.1.1				MAINTENANCE TEST SET	
1.6.1.1.1					DIAGNOSTIC ELEC.
1.6.1.1.2					DISPLAYS/CONTROLS
1.6.1.1.3					SOFTWARE
1.6.1.1.4					RACKS
1.6.1.2				CALIBRATION GAUGES	
1.6.2			SUPPORT & HANDLING EQUIP.		
1.7		SPARES			

+

Spiral	Spiral 1					Spiral 2					Spiral n…					TOTAL (ALL SPIRALS)
Project	Flatscreen Display	Platform Stabilizer	Moving target indicator mode	F-39 Integration	Spiral 1 Total	Autonomous Channel Switching	Synthetic Aperture Mode	Radar Test Set Upgrade	RH-77 Integration	Spiral 2 Total	Project A	Project B	Project C	Project D	Project E	
Contract #	X00014-06-C-0023					TBD					TBD					
Contractor	Radmart / Imaging Solutions	Radmart / Aerial Int'l	Radmart / Bits-R-Us	Radmart / Aero-Outfitters		Radmart / Bits'R-Us	Radmart / Aerial Int'l / Bits-R-Us	Radmart / MTBF Inc.	Radmart / Aero-Outfitters		TBD	TBD	TBD	TBD	TBD	
Estimated Cost	87.3	32.7	177.3	62.1	359.4	58.1	231.4	72.2	94.9	456.6	TBD	TBD	TBD	TBD	TBD	816.0

Note: PAM and WBS development is *iterative*. Use the Program WBS when initially developing the PAM. The PAM will aid in defining/refining the contract and subcontract WBS. Update the PAM as the WBS evolves.

Finding Increment Information

- Sources:
  - Program/Project Managers
  - Program Briefings
  - Cost Analysis Requirements Description (CARD)
  - Spiral Development Plans
    - *Required per National Defense Authorization Act, Dec 2002, Public Law 107-314, Division A, Title VIII, Subtitle A, Section 803*

PAM Format

The intersection of the WBS and the spiral descriptive information defines the content of each project…

WBS Element Code	L1	L2	L3	L4	L5	Spiral	Spiral 1					Spiral 2					Spiral n…					TOTAL (ALL SPIRALS)
						Project	Flatscreen Display	Platform Stabilizer	Moving target indicator mode	F-39 Integration	Spiral 1 Total	Autonomous Channel Switching	Synthetic Aperture Mode	Radar Test Set Upgrade	RH-77 Integration	Spiral 2 Total	Project A	Project B	Project C	Project D	Project E	
						Contract #	X00014-06-C-0023					TBD					TBD					
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						Estimated Cost	87.3	32.7	177.3	62.1	359.4	58.1	231.4	72.2	94.9	456.6	TBD	TBD	TBD	TBD	TBD	816.0
1	RADAR SYSTEM						✔	✔	✔	✔	✔	✔	✔	✔	✔	✔						✔
1.1		PRIME MISSION PRODUCT					✔	✔	✔	✔	✔	✔	✔		✔	✔						✔
1.1.1			DISPLAY				✔		✔		✔		✔			✔						✔
1.1.2			RECEIVER/TRANSMITTER						✔	✔	✔	✔	✔		✔	✔						✔
1.1.3			ANTENNA					✔	✔	✔	✔				✔	✔						✔
1.1.3.1				PEDESTAL				✔		✔	✔				✔	✔						✔
1.1.3.1.1					HOUSING					✔	✔				✔	✔						✔
1.1.3.1.2					PLATFORM			✔			✔											✔
1.1.3.1.3					GYRO			✔			✔											✔
1.1.3.2				SAIL						✔	✔				✔	✔						✔
1.1.3.3				WAVEGUIDE					✔		✔		✔			✔						✔
1.1.4			SOFTWARE				✔		✔	✔	✔	✔	✔		✔	✔						✔
1.2		SE/PM					✔	✔	✔	✔	✔	✔	✔		✔	✔						✔
1.3		ST&E					✔	✔	✔	✔	✔	✔	✔		✔	✔						✔
1.4		TRAINING					✔	✔	✔	✔	✔	✔	✔		✔	✔						✔
1.5		DATA					✔	✔	✔	✔	✔	✔	✔		✔	✔						✔
1.6		SUPPORT EQUIPMENT					✔	✔			✔			✔		✔						✔
1.6.1			TEST & MEASUREMENT EQUIP.				✔	✔			✔			✔		✔						✔
1.6.1.1				MAINTENANCE TEST SET			✔				✔			✔		✔						✔
1.6.1.1.1					DIAGNOSTIC ELEC.									✔		✔						✔
1.6.1.1.2					DISPLAYS/CONTROLS		✔				✔			✔		✔						✔
1.6.1.1.3					SOFTWARE									✔		✔						✔
1.6.1.1.4					RACKS									✔		✔						✔
1.6.1.2				CALIBRATION GAUGES				✔			✔											✔
1.6.2			SUPPORT & HANDLING EQUIP.					✔			✔											✔
1.7		SPARES					✔							✔		✔						✔

PAM Format

PAM "Metadata" fields

Add additional spirals and projects as necessary…

Spiral	Spiral 1					Spiral 2					Spiral n…					TOTAL (ALL SPIRALS)
Project	Flatscreen Display	Platform Stabilizer	Moving target indicator mode	F-39 Integration	Spiral 1 Total	Autonomous Channel Switching	Synthetic Aperture Mode	Radar Test Set Upgrade	RH-77 Integration	Spiral 2 Total	Project A	Project B	Project C	Project D	Project E	
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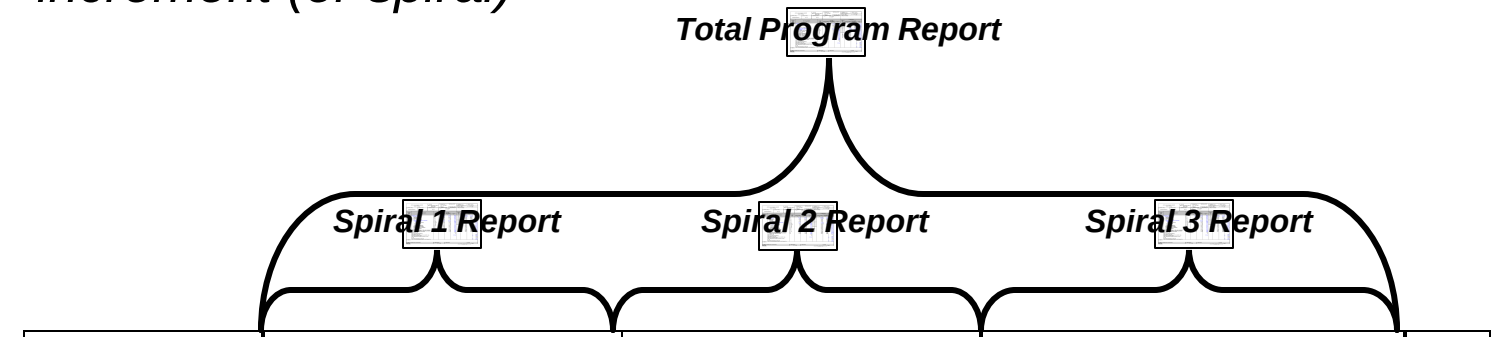
Estimated Cost	87.3	32.7	177.3	62.1	359.4	58.1	231.4	72.2	94.9	456.6	TBD	TBD	TBD	TBD	TBD	816.0

When information is not yet available, simply enter "TBD"

Interpretation of the PAM

- The PAM maps out reporting requirements
  - *In addition to total program reporting, cost must be reported by increment (or spiral)*



Spiral	Spiral 1					Spiral 2					Spiral n…					TOTAL (ALL SPIRALS)
Project	Flatscreen Display	Platform Stabilizer	Moving target indicator mode	F-39 Integration	Spiral 1 Total	Autonomous Channel Switching	Synthetic Aperture Mode	Radar Test Set Upgrade	RH-77 Integration	Spiral 2 Total	Project A	Project B	Project C	Project D	Project E	
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Interpretation of the PAM

- When properly completed, the PAM provides key information for both WBS development and CSDR planning.
- Determine which WBS elements may require lower level definition for cost visibility by project
  - Focus on *children* WBS elements (i.e., elements that are not roll-ups)

EXAMPLE: Two projects address the display element. The addition of children elements to segregate hardware (flatpanel) and software (MTI mode) will help to distinguish those projects

Spiral	Spiral 1				
Project	Flatscreen Display	Platform Stabilizer	Moving target indicator mode	F-39 Integration	Spiral 1 Total
Contract #	X00014-06-C-0023				
Contractor	Radmart / Imaging Solutions	Radmart / Aerial Int'l	Radmart / Bits-R-Us	Radmart / Aero-Outfitters	
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1.1		PRIME MISSION PRODUCT				✔	✔	✔	✔	✔
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1.1.2			RECEIVER/TRANSMITTER					✔	✔	✔
1.1.3			ANTENNA				✔	✔	✔	✔
1.1.3.1				PEDESTAL			✔		✔	✔
1.1.3.1.1					HOUSING				✔	✔
1.1.3.1.2					PLATFORM		✔			✔
1.1.3.1.3					GYRO		✔			✔
1.1.3.2				SAIL					✔	✔
1.1.3.3				WAVEGUIDE				✔		✔
1.1.4			SOFTWARE			✔		✔	✔	✔
1.2		SE/PM				✔	✔	✔	✔	✔
1.3		ST&E				✔	✔	✔	✔	✔
1.4		TRAINING				✔	✔	✔	✔	✔

PRACTICAL EXERCISE
30 MINUTES

- *Using the materials provided, complete the PAM exercise*

Questions / Discussion / Review

- **At this point, you should:**
  - *Understand the differences between traditional "single-step" development and "evolutionary acquisition" development processes*
  - *Understand the differences between "spiral development" and "incremental development" processes*
  - *Understand how evolutionary acquisition impacts cost data reporting*
  - *Understand how to properly structure a PAM*
  - *Be able to use a PAM to refine the WBS*

For more information…

- **Read:**
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    - *The Spiral Model as a Tool for Evolutionary Acquisition,* Dr. Barry Boehm, Wilfred J. Hansen, Crosstalk, May 2001
    - National Defense Authorization Act, Dec 2002, Public Law 107-314, Division A, Title VIII, Subtitle A, Section 803
  - **Internet**
    - DoD 5000.4-M-1, Cost and Software (CSDR) Manual (DRAFT September 2005), DL1.35, C3.5.7, C4.1.1, C5.3.17.2 (http://dcarc.pae.osd.mil/csdr/CSDR_Manual_4-1-04-R22.pdf)